CLAIMS

What is claimed is:

1. A method of balancing data communications loads among data communications ports in systems for automated trading of securities, the systems including at least one broker-dealer system coupled through at least one data communications system to more than one market system, the data communications system including a multiplicity of ports organized so that one market is coupled to the broker-dealer system through more than one port, the method operating as an adjunct to a broker-dealer system, the method applied when a new order from the broker-dealer system is available and ready to be sent through a port to a market; the method being applied continually in turn to each of the ports assigned to a market, the method comprising the steps of:

    receiving through a port from a market to which the port is coupled a new acknowledgment of an order previously sent through the port from the broker-dealer system to the market;
    sending the new acknowledgment to the broker-dealer system;
    determining that the port is not overloaded, the determination being dependent upon the previously-sent order, the new acknowledgment, and optionally also dependent upon other previous orders and upon previous acknowledgments; and
    sending a new order through the port to the market, the sending of the new order being dependent upon the determination that the port is not overloaded.

2. The method of claim 1 wherein determining that the port is not overloaded comprises determining that a latency for the port is less than a maximum allowed latency for the port, wherein latency comprises a measure of the speed with which markets return

acknowledgments for orders.

3. The method of claim 1 further comprising decrementing a net order count for the port, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein the net order count is decremented after receiving a new acknowledgment.

4. The method of claim 3 further comprising the steps of:

determining that the net order count is less than a maximum allowed net order count for the port, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the port, wherein the net order count less than the maximum allowed net order count for the port indicates that the port is not overloaded; and

incrementing the net order count.

5. The method of claim 1 further comprising incrementing an acknowledgment count for the port, wherein the acknowledgment count represents the number of acknowledgments received through the port during a defined period of time.

6. The method of claim 5 further comprising the steps of:

determining that an order count for the port exceeds the acknowledgment count for the port by at least a maximum allowed net order count, wherein the order count represents the number of orders sent through the port during the defined period of time, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent

through the port, wherein the order count for the port exceeding the acknowledgment count for the port by at least a maximum allowed net order count indicates that the port is not overloaded; and

incrementing the order count for the port.

7. The method of claim 1 further comprising determining, before sending the new order through the port to the market, that the port is a least-loaded port, wherein sending the order through the port to the market is dependent upon determining that the port is a least-loaded port.

8. The method of claim 7 wherein the port comprises a net order count, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, and other ports coupled to the market have net order counts, wherein determining that the port is a least-loaded port comprises determining that the net order count for the port is not greater than any of the net order counts for the other ports coupled to the market.

9. The method of claim 7 wherein the port comprises latency, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein the other ports coupled to the market have latencies, wherein determining that the port is a least-loaded port comprises determining that the latency for the port is not greater than any of the latencies for the other ports coupled to the market.

10. The method of claim 7 wherein the port comprises a net order count and a latency, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein latency comprises a measure of the speed with which markets return

acknowledgments for orders, wherein the other ports coupled to the market have net order counts and latencies, wherein determining that the port is a least-loaded port comprises determining that the product of the net order count for the port multiplied by the latency for the port is not greater than the product of net order count and latency for any other port coupled to the market.

11. A load balancing system for automated trading of securities in which data communications loads are balanced among data communications ports, the load balancing system coupled to a multiplicity of ports organized so that one market is coupled to the broker-dealer system through more than one port, the load balancing system operative when a new order from a broker-dealer system is available and ready to be sent through a port to a market, the load balancing system operative continually in turn upon each of the ports assigned to a market, the load balancing system comprising:

at least one computer processor coupled for data communications to at least one broker-dealer system and coupled through data communications ports to more than one market, the processor programmed to:

receive through a port from a market to which the port is coupled a new acknowledgment of an order previously sent through the port from the broker-dealer system to the market;

send the new acknowledgment to the broker-dealer system;

determine that the port is not overloaded, the determination being dependent upon the previously-sent order, the new acknowledgment, and optionally also dependent upon other previous orders and upon previous acknowledgments; and

send a new order through the port to the market, the sending of the new order being dependent upon the determination that the port is not overloaded; and

computer memory coupled to the processor, the processor further programmed to store in the computer memory the new acknowledgment and the new order.

12. The load balancing system of claim 11 wherein the processor programmed to determine that the port is not overloaded comprises the processor programmed to determine that a latency for the port is less than a maximum allowed latency for the port, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders.

13. The load balancing system of claim 11 further comprising the processor programmed to decrement a net order count for the port, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein the net order count is decremented after receiving a new acknowledgment.

14. The load balancing system of claim 13 further comprising the processor programmed to:

determine that the net order count is less than a maximum allowed net order count for the port, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the port, wherein the net order count less than the maximum allowed net order count for the port indicates that the port is not overloaded; and

increment the net order count.

15. The load balancing system of claim 11 further comprising the processor programmed to increment an acknowledgment count for the port, wherein the acknowledgment

count represents the number of acknowledgments received through the port during a defined period of time.

16. The load balancing system of claim 15 further comprising the processor programmed to:

determine that an order count for the port exceeds the acknowledgment count for the port by at least a maximum allowed net order count, wherein the order count represents the number of orders sent through the port during the defined period of time, wherein the maximum allowed net order count indicates the maximum number of orders without acknowledgments allowed to be sent through the port, wherein the order count for the port exceeding the acknowledgment count for the port by at least a maximum allowed net order count indicates that the port is not overloaded; and

increment the order count for the port.

17. The load balancing system of claim 11 further comprising the processor programmed to determine, before sending the new order through the port to the market, that the port is a least-loaded port, wherein sending the order through the port to the market is dependent upon the determination that the port is a least-loaded port.

18. The load balancing system of claim 17 wherein a data structure for the port comprises a net order count for the port, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, and other ports coupled to the market have data structures having net order counts, wherein the processor programmed to determine that the port is a least-loaded port comprises the processor programmed to determine that the net order count for the port is not greater than any of the net order counts for

the other ports coupled to the market.

19. The load balancing system of claim 17 wherein a data structure for the port comprises latency, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein the other ports coupled to the market have data structures having latencies, wherein the processor programmed to determine that the port is a least-loaded port comprises the processor programmed to determine that the latency for the port is not greater than any of the latencies for the other ports coupled to the market.

20. The load balancing system of claim 17 wherein a data structure for the port comprises a net order count and a latency, wherein the net order count indicates the net number of orders sent through the port to the market for which acknowledgments have not yet been received from the market, wherein latency comprises a measure of the speed with which markets return acknowledgments for orders, wherein the other ports coupled to the market have data structures having net order counts and latencies, wherein the processor programmed to determine that the port is a least-loaded port comprises the processor programmed to determine that the product of the net order count for the port multiplied by the latency for the port is not greater than the product of net order count and latency for any other port coupled to the market.